

Attorney Docket No. INFG0004

CONFIGURABLE NETWORK APPLIANCE
**METHOD AND APPARATUS FOR CONFIGURING
AN INTERNET APPLIANCE**

BACKGROUND OF THE INVENTION

TECHNICAL FIELD

The invention relates to electronic communication systems. More particularly, the invention relates to a system for upgrading and configuring an Internet appliance from databases distributed over an electronic network.

DESCRIPTION OF THE PRIOR ART

Electronic networks are increasingly used to store and distribute a variety of data. Examples of such electronic networks include the Internet, and intranet systems. For example, World Wide Web (Web) pages (which may be accessed over the Internet) may include text, graphical displays, video displays, animation, and sounds.

The Web is usually accessed via telephone lines by a modem-connected computer. However, the Web may also be accessed through other devices, including personal data assistants, fax machines, and internet-compatible telephones. One telephone that provides Web access is described in M. Valentaten, B. Moeschon, Y. Friedman, Y.-T. Sidi, Z. Blkowsky, Z. Peleg, *Multi-Mode Home Terminal System that Utilizes a Single Embedded General Purpose/DSP Processor and a Single Random Access Memory*, U.S. Patent No. 5,250,940 (October 5, 1993).

A Web page is encoded in Hypertext Markup Language (html). An html document is a plain-text (ASCII) file that uses tags to denote the various elements in the document. An element may include an attribute, which is additional information that is included between tags.

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HTML can be used to link text and/or images, such as icons, to another document or section of a document. The user activates a link by clicking on it, and the linked database is directly accessed. Links are used to access related information, or to contact a person or entity. However, information on a Web page must have the requisite html tags to provide an active link.

10 It is known to download modifications to computer software from the Web. The user selects a hypertext link on a Web page and the appropriate data is downloaded to the user's computer. The user then uses the downloaded data to upgrade the computer. However, such downloads are typically either software applications or graphical representations, such as icons.

15 A Web page may also provide other useful information. For example, various settings, such as an Internet Service Provider's (ISP) access telephone number may be stored on a Web page. However, the user must still manually configure the computer to change this information locally. In addition to the options and settings necessary to connect to the Web, such Internet appliances as an Internet-compatible telephone also require settings for telephone functions. Such telephone functions include service features, such as Caller ID or Call Waiting, as well as the graphical user interface for displaying the telephone functions, and user profile configuration information, such as how to dial, local area code, and the user's name, address, and zip code.

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An Internet appliance, such as the Internet-compatible telephone, typically is limited processing power and memory storage, as compared to a computer. Thus, it is advantageous to minimize the power and memory required to modify the configurations and features of the appliance.

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It would therefore be an advantage to provide a method and system for automatically configuring an Internet-compatible telephone from the Internet. It would be a further

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advantage if such method and system minimized the processing power and memory storage required for such upgrade.

SUMMARY OF THE INVENTION

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The invention provides a method and system for automatically configuring an Internet appliance from a Web page, i.e. via an html page. The invention is modified variables that include, options, settings, and supported features, as well as the graphical user interface for the Internet appliance. Such variable may consist of, for example, Internet Service Provider (ISP) telephone numbers, user's area code, name, address, and zip code and such calling features as call waiting, call forwarding, and last call returned. Uniquely, the features provided by the invention are implemented by a novel put/get mechanism.

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The preferred embodiment of the invention is adapted for use with the Internet appliance described above (see U.S. Patent No. 5,250,940.) However, alternative embodiments of the invention are adapted for use with any Internet access device. In the preferred embodiment, the Internet appliance accesses a special HTML page on a Web site containing configuration information for the appliance. This HTML page is used to modify the Internet appliance.

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In one embodiment of the invention, data from the HTML page are downloaded to the Internet appliance to modify its options or settings automatically upon accessing the page. However, in the preferred embodiment of the invention, the HTML page includes special tags that direct the Internet appliance to perform certain operations. The user then selects the desired options and settings and the Internet appliance is adjusted accordingly per the definitions contained in the HTML page.

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In an alternative, equally preferred embodiment, the upgrade data are downloaded from the HTML page to programmable memory in the Internet appliance. The stored data are then used to upgrade the Internet appliance.

HTML pages containing configuration data for the Internet appliance may be stored on a server, or on any computer accessible via the Internet. For example, the server may maintain a cache of Web pages frequently accessed by the Internet appliance, such as HTML pages containing configuration data.

In one embodiment of the invention, an upgrade Web page alerts the user when new information regarding changes to options and settings of the Internet appliance are available. Equipment or service companies, such as a telephone company, can provide HTML pages on their Web sites to make upgrades available to its users. A user then selects new features, such as Call Forwarding, or upgrades existing services directly from the telephone company.

In a preferred embodiment of the invention, telephone service information is automated. In this embodiment, a selectable area is provided on a graphical user interface of the Internet appliance. When this area is selected, the Web page for the desired service is automatically accessed, and the data are downloaded.

A profile of the Internet-compatible telephone user may be stored in the Internet appliance. The HTML page uses this profile to provide customized services. For example, the users profile information can be retrieved from the Internet appliance and sent to a Web site to provide personalized or localized services.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a diagram of an Internet-compatible telephone connection to the Internet according to a preferred embodiment of the invention;

Fig. 2 is a flowchart of the method for configuring an Internet appliance according to the invention;

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Fig. 3 is a schematic representation of an HTML page showing a put operation according to the invention; and

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Fig. 4 is a schematic representation of an HTML page showing a get operation according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

10 The invention provides a method and system for automatically configuring and/or querying an Internet appliance from a Web page. The invention is a user-friendly and efficient method and system for configuring the options and settings of an Internet appliance, such as an Internet-compatible telephone. Additionally, the invention is also operable to modify the features supported by the Internet appliance, as well as the graphical user interface for the appliance display. The preferred embodiment of the invention is adapted for use with an Internet appliance (see U.S. Patent No. 5,250,940.) However, alternative embodiments of the invention are adapted for use with any Internet access device.

20 The Web is usually accessed via telephone lines by a modem-connected computer, or Internet access appliance. The client dials up an Internet Service Provider (ISP), for example using the Point-to-Point protocol (PPP). In turn, the ISP host establishes the connection to the Internet.

25 Fig. 1 is a diagram of an Internet-compatible telephone showing a connection to the Internet according to the invention. The Internet-compatible telephone 10 uses a modem 12 to dial-up a modem 14 at the ISP's local point-of-presence (POP). This modem 12 transmits information from the client to a server 16 residing on the ISP's local area network (LAN) 18. The server uses Hypertext Transfer Protocol (HTTP) and TCP/IP protocol 20 to communicate, via a datalink 22 to the Internet 24. The

Sub B17 Internet-compatible telephone displays the information retrieved from the Internet on its display screen 26 using a browser application 28.

5 Fig. 2 is a flowchart of the method for configuring an Internet appliance according to the invention. For example, an Internet-compatible telephone has many settings within it that control functions of the telephone. Such settings include the telephone numbers for dialing in to the ISP network, user names, profile information, local default pages, as well as settings for handling connecting and disconnecting, time outs, and special calling features related to the telephone portion of the appliance, such as call waiting and call forwarding.

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10 To reconfigure these options and settings, the Internet-compatible telephone is connected to a Web site (100) containing configuration information for the telephone. The Internet-compatible telephone then accesses an HTML page (105) on that Web site. This HTML page is used to configure the Internet-compatible telephone.

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20 In one embodiment of the invention, data from the HTML page are downloaded to the Internet-compatible telephone to reconfigure its options or settings automatically. However, in the preferred embodiment of the invention, the HTML page includes special tags that direct (110) the Internet-compatible telephone to perform certain operations. Such operations include requesting the user to answer questions on a form, or to choose options from a table.

25 The user then selects (115) the desired options and settings. In a preferred embodiment of the invention, the settings provided by the HTML page include special HTML codes that automatically adjust (120) the Internet-compatible telephone accordingly. In an alternative, equally preferred embodiment, the data are downloaded (125) from the HTML page to programmable memory, such as flash memory, in the Internet-compatible telephone. The data stored in the flash memory are then used to configure (130) the Internet-compatible telephone. This foregoing operation may be implemented using a unique put/get mechanism (discussed below).

5 The preferred embodiment of the invention may also implement a security scheme to prevent the intentional corruption of the information contained within the Internet appliance, for example, by a virus, or as a result of an unauthorized or unintentional reconfiguration request.

10 In one embodiment of the invention, the upgrade Web page includes information that alerts the user when the HTML page contains new information regarding changes to options and settings of the Internet-compatible telephone. The user may select particular options or settings for which the user wishes to receive notification, or the user may be notified of all changes to the options or settings. The Internet-compatible telephone may then either be automatically reconfigured with these changes, or reconfigured at the user's discretion.

15 Any HTML page may be created with the special tags that are required to reconfigure and/or query Internet-compatible telephone functions. Thus, equipment or service companies, such as a telephone company, can provide such HTML pages on their Web sites. A user then selects new features, such as Call Forwarding, or upgrades existing services directly from the telephone company.

20 In a preferred embodiment of the invention, a selectable area is provided on a graphical user interface of the Internet appliance, such as a slide-up window. The user selects the area, the Web site maintaining the HTML page for the desired service is automatically accessed, and the data are downloaded from the server to the Internet appliance to effect modification of the Internet appliance.

25 The HTML page can also include hyperlinks to other sites of interest to the user. In one embodiment of the invention, each linked HTML page provides the user with additional information and options. When the user decides to make a particular change, another hyperlink may be selected to implement the change. Such hyperlinks can be to more than one server site. For example, a user who desires to

change the Internet-compatible telephone browser application to Japanese settings could select a hyperlink to a server in Japan.

5 Uniquely, the invention provides a novel mechanism that supports both HTML push and pull data transmission between the Internet and the Internet appliance, and that provides automated functions therefore. Such functions can include, for example an upgrade or reconfiguration of the Internet appliance, checking e-mail, putting information, and getting information. With regard to configuration, the mechanism provides for the setting and resetting of various user preferences or system required preferences (for example an Intranet that has been customized for a particular company's requirements). Further, functionality can include monitoring functions such as checking variables and getting the state of an upgrade. For example, such monitoring functions may be used to determine if the Internet appliance does not include the most recent version of a particular operating element.

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15 In connection with the put/get function, a server shows a configuration Web page. The Internet appliance is operable to put information, such as field information, into its local nonvolatile memory. Alternatively, the server can transparently put this information into the Internet appliance's nonvolatile memory. Uniquely, this information is derived from the contents of the HTML page.

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25 With regard to the get function, the server may show an HTML page in which there is a get function. The Internet appliance may place values into this HTML page, i.e. substitute them into the HTML page dynamically before redisplaying the page locally. Thus, the Internet appliance gets information from its nonvolatile memory and substitutes it into an HTML page. The Internet appliance can send the HTML page with the information that was received (gotten) from the nonvolatile memory and return the HTML page to the server.

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In summary, the put/get functions allow the placing of information, from the Internet appliance into a form and/or the putting of information from any other form into the

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Internet appliance. For example, a telephone company may provide a calling feature page (see Fig. 3). Such page may query the user as to what calling features are desired. The user would check those features. In Fig. 3, the user has checked call waiting and call forwarding. The user would also complete a registration page. When the form is completed, the HTML information that is sent from the telephone company server includes configuration information for the Internet appliance that is put into the Internet appliance, such that the telephone function with the Internet appliance is configured for call waiting and call forwarding functions. In the preferred embodiment of the invention, this information would be placed into a flash EEPROM or other such storage device in the Internet appliance.

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FIG. 4 shows an example of a get function. In this example, a search page is shown that is presented at the Internet appliance pursuant to a Yellow Pages search. With regard to certain fields within the form, the Internet appliance may have been configured to supply information to complete the form. For example, for each search, the form automatically confines the search to the State of Arkansas because the Internet appliance is located in Arkansas and it is assumed that a Yellow Page search is conducted locally. In such case, each time the search page for the Yellow Pages is retrieved, the HTML mechanism gets the state information from memory within the Internet appliance. In this way a default is established.

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Additionally, the put/get functions may be used with regard to variables, for example with regard to configuration of the Internet appliance and the operating status for various Internet appliance features (for example is the Internet appliance operating properly). Finally, the put/get functions may be used within an Intranet, for example to configure the Internet appliance to a company's particular requirements.

The following provides two examples of the put/get mechanism in accordance with the invention.

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Example 1

An HTML file for the Get / Put mechanism of internal client parameters:

<HTML>

<pre>

<FORM action="iph://phone/cfg_put">

user name: <INPUT type=text name="cfg_isp_user_name" >

<INPUT type=hidden name="cfg_isp_phone" value="1-408-1234">

<INPUT type=submit value=put>

</FORM>

<FORM action="http://www.infogear.com/mydirectory/myscript.cgi">

user name: <INPUT type=text name="my_username"

value="%cfg_isp_user_name">

<INPUT type=hidden name="my_dialin" value="%cfg_isp_phone">

<INPUT type=submit value=get>

</FORM>

</pre>

</HTML>

Explanation

This file includes two forms, the first for 'put' (write new values for configuration parameters, and the second for 'get' (read information from configuration parameters).

In the first form there are two variables that are written as soon as the user presses the submit button. The first variable is the 'user name' setting on the Internet appliance. In the example, the user is required to input his name. The second variable is the telephone number of the ISP. In the example above, the number is fixed, and is hidden from the user.

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In the second form, there are two variables that are read as soon as the user presses the submit button, and are sent to the user's script called 'myscript'. The first variable is the 'user name' setting on the Internet appliance. In the example, the user can change the name, using the internal name as default. The second variable is the phone number of the ISP. In the example above, the telephone number is read automatically without the user knowledge.

Example 2

10 An HTML file for Internet appliance internal function call from within an HTML file:

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<HTML>

<FORM action="iph://phone/dial">

Phone to dial: <INPUT type=text name="p" value="1-408-1234">

<INPUT type=submit value=dial>

</FORM>

 Dial link

</HTML>

Explanation

25 The example uses the telephone internal 'dial' function. The first section is a form that allows the user to type a telephone number to dial in an edit box. The second section is a link that dials a fixed telephone number.

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The invention is best appreciated when it's considered that HTML is currently the content of a particular page and the format. In the invention, HTML is a part of a program in that the HTML tags themselves perform programming functions, such as

5 configuration or completion of a form. In previous uses of HTML, these functions were
performed by a user, for example in response to instruction contained and read from
an HTML page by a user. In this regard, the invention is seen as being broadly
applicable to any type of programming environment, for example where the HTML
code may be used to provide a user interface for an embedded device. In this case
the HTML is the user interface and the uniform resource locators are functions of a
program within the user interface. For example, an HTML front end may be provided
as a user interface to a C code program. In such case, there is no need to compile the
user interface and the user interface is therefore portable and readily accessible. This
is particularly true because HTML is relatively simple programming language. In this
regard, a user interface may be provided with a more complex program, for example a
word processing program or spreadsheet program written in C, in which case the user
interface is readily customized by the user without the need to know the underlying
programming language, i.e. C.

15 A URL in general is described in *Uniform Resource Locators (URL)*, RFC 1738
(www.23.org/addressing/RFC1738.txt). In accordance with the invention, a URL may
be thought of as describing a protocol (for example, http) in which there is a host (the
put or get location) and a particular location within the host (for example, flash
memory). The URL is uniquely used to call internal functions of the device (either the
client or the server) to get information or to put information as required. In connection
with the Internet appliance, a particular URL may be used (for example l_ph:// or
iPh://gw). In this example the host is the Internet appliance and the location within the
Internet appliance is the function called (for example the setting of call waiting).

25 Additional applications of the herein disclosed invention include the calling of internal
functions of the Internet appliance, when the Internet appliance is operating as a Web
client, via HTML pages. For example, a uniform resource locator (URL) may be used
to define resources or functions within the Web client, e.g. checking e-mail.

Although the invention is described herein with reference to the preferred embodiment, one skilled in the art will readily appreciate that other applications may be substituted for those set forth herein without departing from the spirit and scope of the present invention. For example, a profile of the Internet-compatible telephone user may be stored in the Internet-compatible telephone. The HTML page includes special functionality that accesses this profile to allow the system to provide customized services, such as the sending of certain material to the user. Accordingly, the invention should only be limited by the Claims included below.

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FOOTNOTES